

## CLAIMS

What is claimed is:

1. A method of processing data comprising:  
defining a class which supports an option data structure having, in  
5 instances of the class, references to option values without preallocation of  
memory space for the full option values, the option data structure including a  
type description of the option values; and  
during compilation, using the type description in the option data structure  
to process an operation on the option value.
- 10 2. A method as claimed in claim 1 wherein the option data structure identifies  
change handler code that is executed when an option value changes.
3. A method as claimed in claim 2 wherein change handler code for one option is  
defined in different classes within a class inheritance hierarchy and the change  
handler code from each class is executed when the option value changes.
- 15 4. A method as claimed in claim 1 wherein the option data structure includes a  
default value, the method further comprising, in a get operation to an instance of  
the class, if an option value which applies to the instance has been set, getting  
the set option value and, if no value which applies has been set, getting the  
default value for the class.
- 20 5. A method as claimed in claim 1 comprising:  
defining a first class with a first option data structure of a first form  
which supports, in instances of the class, references to option values without  
preallocation of memory space for the full option values;

09759697-011204

defining a second class with a second option data structure of a second form which supports, in instances of the second class, references to option values without preallocation of memory space for the full option values, the second form being different from the first form; and

5                   during compilation, encoding an option operation as a method call to an object of the first class and to an object of the second class without regard to the form of the option data structure supported by the class.

6.       A method as claimed in claim 1 further comprising:

10                   notifying objects of a change in an option value through a change handler identified by an option binding, the option binding being located by first searching a mapping data structure for a previously computed mapping to the option binding and, if no mapping was previously computed, by then computing the mapping to the option binding and storing the mapping in the mapping data structure.

15       7.       A method as claimed in claim 1 wherein the option data structure comprises a linked list of option items having option values.

8.       A method as claimed in claim 1 wherein a nonlocal option value applies to other objects in a nonlocal option hierarchy.

20       9.       A method as claimed in claim 8 wherein the nonlocal option hierarchy is a graphical hierarchy.

10.       A method as claimed in claim 1 wherein the class which supports the option data structure includes defined fields to support values in preallocated memory space.

00759597-044204

11. A method as claimed in claim 1 wherein the type description is used to check the declared type of a value to be set in a set operation.
12. A method as claimed in claim 1 wherein the type description is used to check the legality of an operation to be performed on a value obtained in a get operation.
- 5 13. A data processing system comprising:  
a class which supports an option data structure having, in instances of the class, references to option values without preallocation of memory space for the full option values, the option data structure including a type description of the option values; and  
10 a compiler which, when processing an operation on an option value in an instance of the class, uses the type description of the option value in the option data structure.
14. A system as claimed in claim 13 wherein the option data structure identifies change handler code that is executed when an option value changes.
- 15 15. A system as claimed in claim 14 wherein change handler code for one option is defined in different classes within a class inheritance hierarchy and the change handler code from each class is executed when the option value changes.
16. A system as claimed in claim 13 wherein an option data structure includes a default value which is obtained when no option value has been set in an  
20 applicable instance object.
17. A system as claimed in claim 13 comprising plural classes having data structures of different forms, and a compiler which encodes an option operation as a

09759697-044204

method call to an instance object of one of the classes without regard to the form of the option data structure supported by the class.

18. A system as claimed in claim 13 further comprising change handlers which notify objects of a change in an option value and a mapping data structure which maps an option name and class to an option binding which identifies a change handler.
19. A system as claimed in claim 13 wherein the option data structure comprises a linked list of option items having option values.
20. A system as claimed in claim 13 wherein a nonlocal option value applies to other objects in a nonlocal option hierarchy.
21. A system as claimed in claim 20 wherein the nonlocal option hierarchy is a graphical hierarchy.
22. A system as claimed in claim 13 wherein the class which supports the option data structure includes defined fields to support values in preallocated memory space.
23. A system as claimed in claim 13 wherein the type description is used to check the declared type of a value to be set in a set operation.
24. A system as claimed in claim 13 wherein the type description is used to check the legality of an operation to be performed on a value obtained in a get operation.

25. A data processing system comprising;  
means for defining a class which supports an option data structure  
having, in instances of the class, references to option values without  
preallocation of memory space for the full option values, the option data  
5 structure including a type description of the option values; and  
compiler means for processing an operation on an option value using the  
type description in the option data structure.
26. A computer program product comprising:  
a computer usable medium for storing data; and  
10 a set of computer program instructions embodied on the computer usable  
medium, including instructions to  
define a class which supports an option data structure having, in  
instances of the class, references to option values without preallocation of  
memory space for the full option values, the option data structure including a  
15 type description of the option values; and  
during compilation, use the type description of the option value in  
the option data structure to process an operation on the option value.
27. A product as claimed in claim 26 wherein the option data structure comprises a  
linked list of option items having option values.
- 20 28. A computer data signal comprising a code segment including instructions to:  
define a class which supports an option data structure having, in  
instances of the class, references to option values without preallocation of  
memory space for the full option values, the option data structure including a  
type description of the option values; and  
25 during compilation, use the type description of the option value in the  
option data structure to process an operation on the option value.

09250607 011204